## CLAIMS

1. A permanent magnet for a particle accelerator to be used in an environment in which the magnet is exposed to a radiation at an absorbed dose of at least 3,000 Gy,

wherein the magnet includes R (which is at least one of the rare-earth elements), B (boron), TM (which is at least one transition element and includes Fe) and inevitably contained impurity elements, and

wherein the magnet is a sintered magnet that has been magnetized to a permeance coefficient of 0.5 or more and that has a coercivity $H_{cJ}$ of 1.6 MA/m or more.

2. The permanent magnet of claim 1, wherein the sintered magnet has a composition including

25.0 mass% to 40.0 mass% of R,

0.8 mass% to 1.2 mass% of B,

inevitably contained impurity elements, and

TM as the balance.

3. The permanent magnet of claim 1 or 2, wherein R

includes Nd and/or Pr as its essential element(s).

4. The permanent magnet of claim 3, wherein R further includes Dy and/or Tb.

5. The permanent magnet of one of claims 1 to 4, wherein TM includes Co, which accounts for at most 1.0 mass% of the overall magnet.

6. A magnetic field generator to be used in an environment in which the magnetic field generator is exposed to a radiation at an absorbed dose of at least 3,000 Gy,

the magnetic field generator including a plurality of permanent magnets that are arranged substantially in a ring so as to define a magnetic field generating space,

wherein each said permanent magnet includes R (which is at least one of the rare-earth elements), B (boron), TM (which is at least one transition element and includes Fe) and inevitably contained impurity elements, and

wherein the magnet has been magnetized to a permeance

coefficient of 0.5 or more and has a coercivity $H_{cJ}$ of 1.6 MA/m or more.

7. The magnetic field generator of claim 6, wherein the sintered magnet has a composition including

25.0 mass% to 40.0 mass% of R,

0.8 mass% to 1.2 mass% of B,

inevitably contained impurity elements, and

TM as the balance.

8. The magnetic field generator of claim 7, wherein the permanent magnets include a first magnet and a second magnet, which face each other with the magnetic field generating space interposed, and

wherein the first and second magnets are arranged along a line that passes a center portion of the magnetic field generating space and that is parallel to a magnetic field direction in the center portion.

9. The magnetic field generator of claim 8, wherein a

magnet assembly made up of the permanent magnets is substantially symmetric with respect to a first plane including the line, but is asymmetric with respect to a second plane that includes the line but that crosses the first plane at right angles.

10. The magnetic field generator of claim 9, wherein at least a portion of the outer periphery of the magnet assembly is covered with a ferromagnetic material.

11. The magnetic field generator of claim 10, wherein the permanent magnets further include

a third magnet and a fourth magnet, which are arranged so as to sandwich the first magnet between them, and

a fifth magnet and a sixth magnet, which are arranged so as to sandwich the second magnet between them, and

wherein the size of the third magnet as measured perpendicularly to the second plane is smaller than that of the fourth magnet as also measured perpendicularly to the second plane, and

wherein the size of the fifth magnet as measured perpendicularly to the second plane is smaller than that of the sixth magnet as also measured perpendicularly to the second plane.

12. The magnetic field generator of claim 11, further comprising additional magnets for changing the strength of the magnetic field to be generated in the magnetic field generating space,

wherein the additional magnets form a moving magnetic circuit portion, which couples magnetically to at least some of the permanent magnets, and are supported such that their positions relative to the magnetic field generating space are changeable.

13. The magnetic field generator of claim 12, wherein the moving magnetic circuit portion includes a plurality of magnets as its members, the magnets being movable horizontally.

14. The magnetic field generator of one of claims 11 to 13, wherein the permanent magnets further include a seventh magnet, which is located between the fourth and sixth magnets.

15. The magnetic field generator of one of claims 6 to 14, further comprising a mechanism for keeping the temperature of the permanent magnets lower than room temperature.

16. The magnetic field generator of one of claims 6 to 15, wherein a ferromagnetic body, which changes its thickness according to a distance from the second plane, is provided on each of opposed surfaces of the first and second magnets.

17. The magnetic field generator of one of claims 6 to 15, wherein each of the permanent magnets has a rectangular parallelepiped shape.

18. A particle accelerator comprising

the magnetic field generator of one of claims 6 to 17,

and

a shielding plate with a thickness of at least 0.1 mm, which is provided between the magnetic field generator and a source of a radiation.